SITA

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SITA AIRCOM Data Link Services and Products

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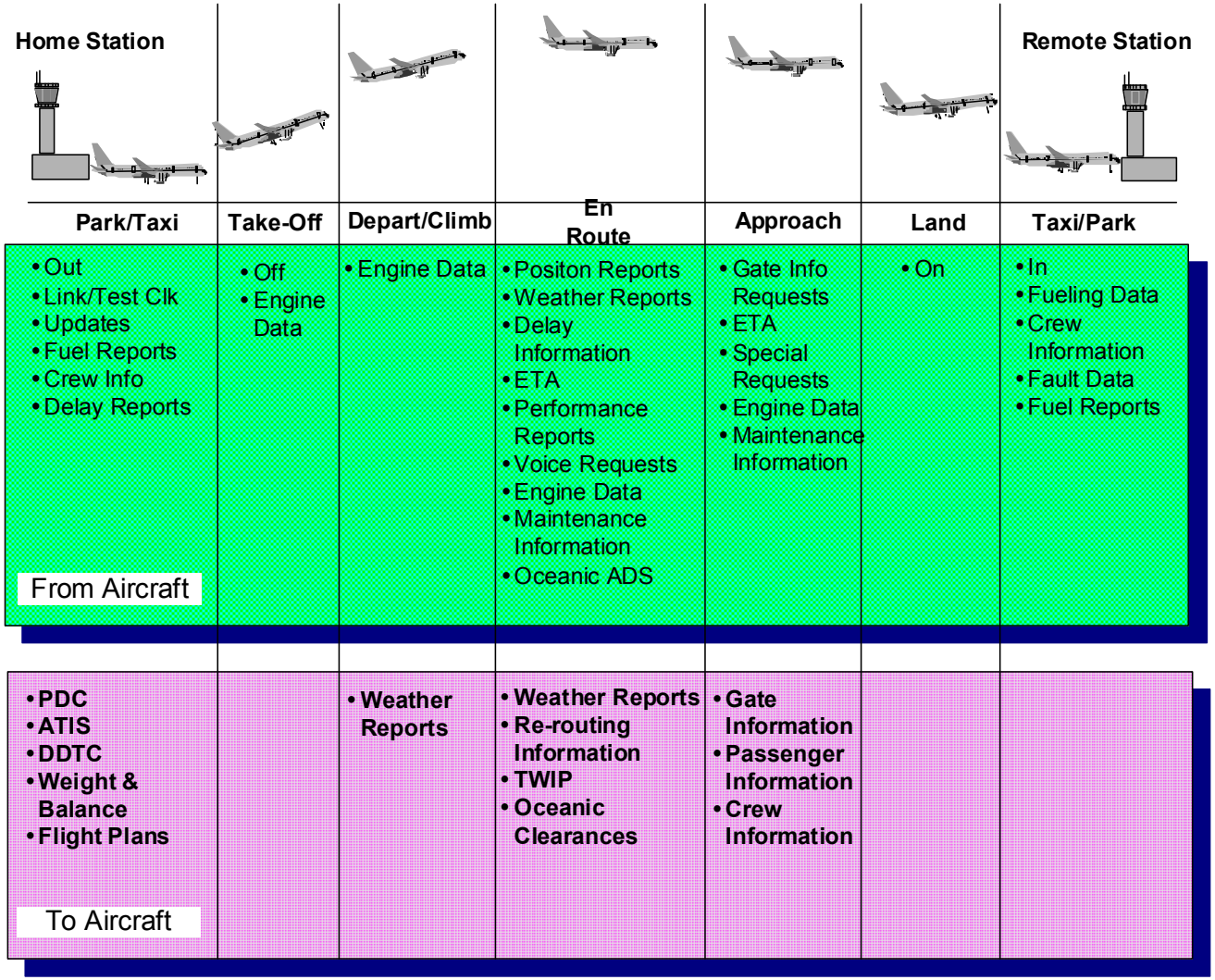
Overview

- SITA Aircraft Communications Service
- AIRCOM Airline Host Offerings
- AIRCOM Coverage
- VDL AIRCOM
- ATS AIRCOM Services
- ATS AIRCOM Systems
- ATN Background and Status
- IP-based Solutions
- EFB
- Conclusion

SITA Aircraft Communications

- **SITA provides communications service for aircraft equipped with ACARS/FANS and Inmarsat avionics.**
  - **SITA participated in the definition of the ACARS/FANS-1 industry standards by the Airlines Electronic Engineering Committee, which is run by ARINC Industry Activities.**
- **SITA operates over 700 VHF data link ground stations in over 160 countries around the world:**
  - **SITA VHF AIRCOM is used by over 6000 aircraft of over 100 airlines exchanging 450,000+ ACARS messages daily.**
- **SITA provides aircraft voice/data service via the Inmarsat satellites:**
  - **SITA Satellite AIRCOM is used by around 1600 of the 2000 air transport aircraft equipped to use the Inmarsat satellites exchanging 100,000+ ACARS messages daily.**

Airline Data Link Applications

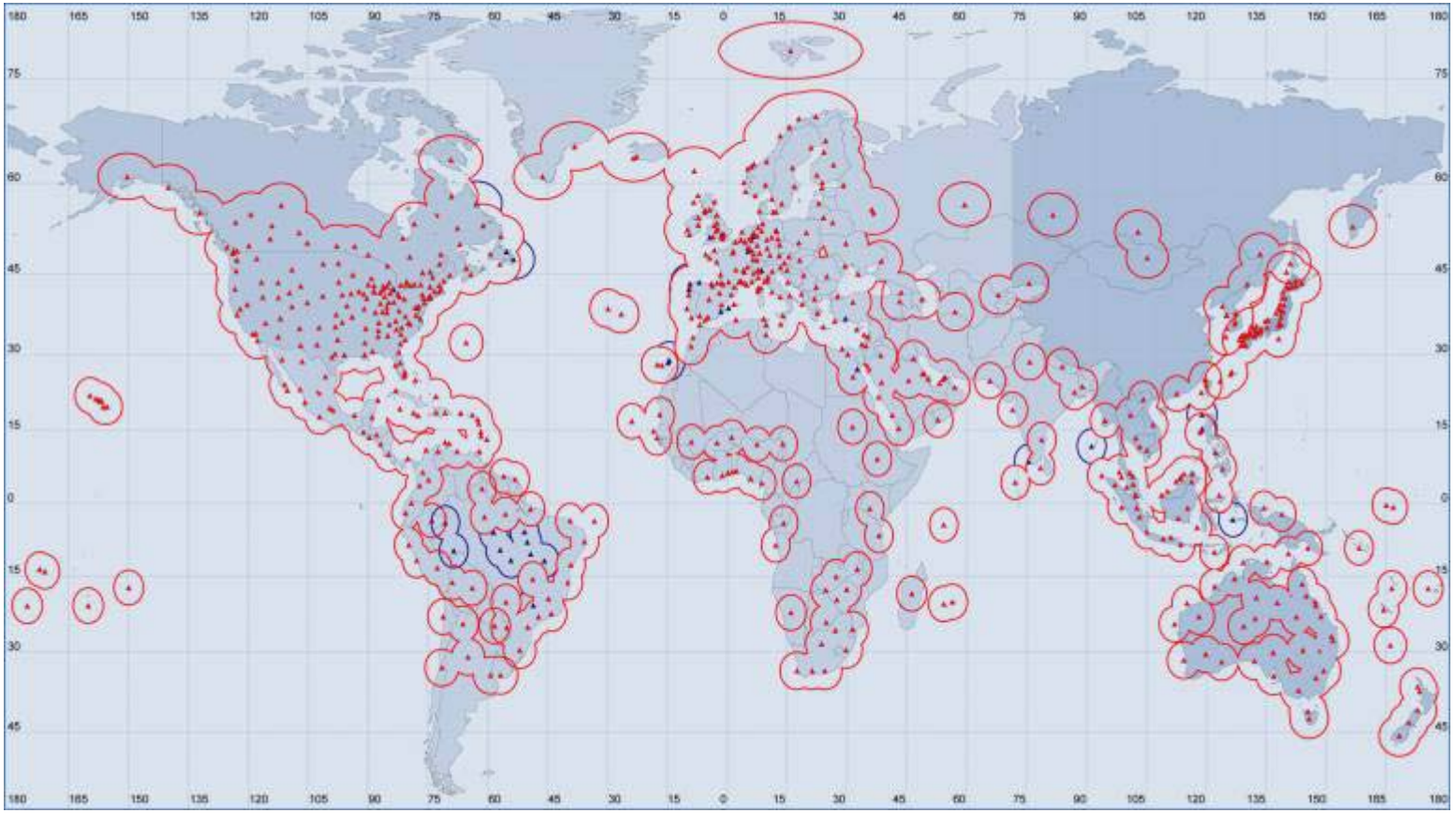


AIRCOM Airline Host Offerings

SITA offers aircraft operators the AIRCOM Server to facilitate the management of their ACARS traffic:

AIRCOMServer (onsite at customer's facility)	▪ Message reformatting and refined distribution ▪ ACARS-specific Mailbox ▪ Aircraft Situation Display ▪ ACARS Fault Detection and Alerting ▪ Charge back capability ▪ Communication interfaces to most airline applications ▪ Connectivity to any DSP
AIRCOM Service Bureau (SITA hosted)	▪ Message reformatting and refined distribution capabilities.

Worldwide VHF AIRCOM ACARS Coverage*



* As of Auugst 2003, Altitude 30,000 feet-On-line RGS** are in red, planned are in blue

** Some of the stations are actually the SITA next generation VHF Ground Stations, referred to as VGSs, which are capable of supporting VDL Mode 2

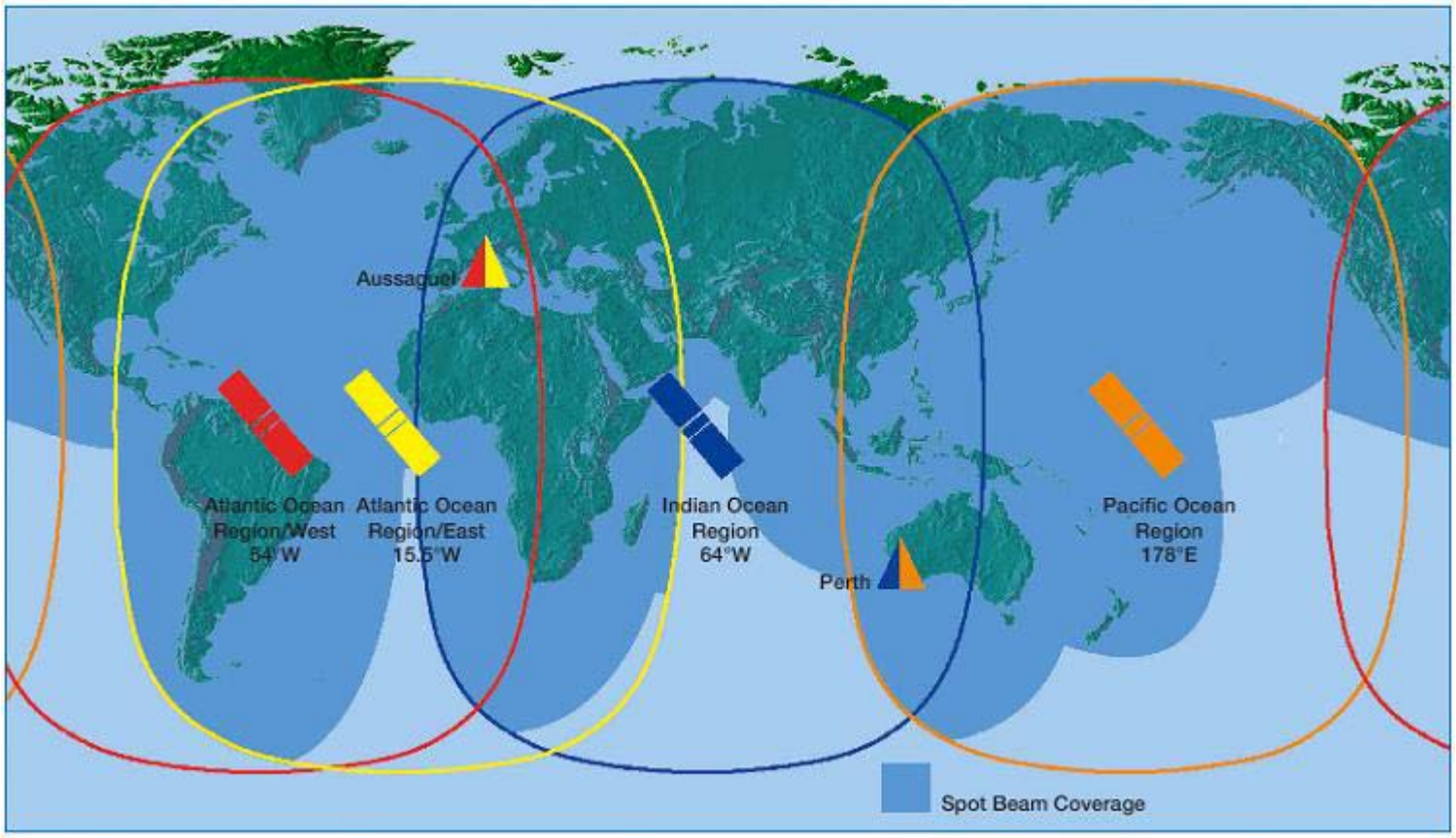
Americas VHF AIRCOM ACARS Coverage*

- **VHF *AIRCOM* Coverage in North America:**
  - **142 Ground Stations in US**
  - **43 Ground Stations in Canada**
  - **13 Ground Stations in Mexico**
  - **SITA recently committed to expand number of ground stations in North America to 330 over the next two years.**

*** As of August 2003, Altitude 30,000 feet-On-line RGS** are in red, planned are in blue**

**** Some of the stations are actually the SITA next generation VHF Ground Stations, referred to as VGSs, which are capable of supporting VDL Mode 2**

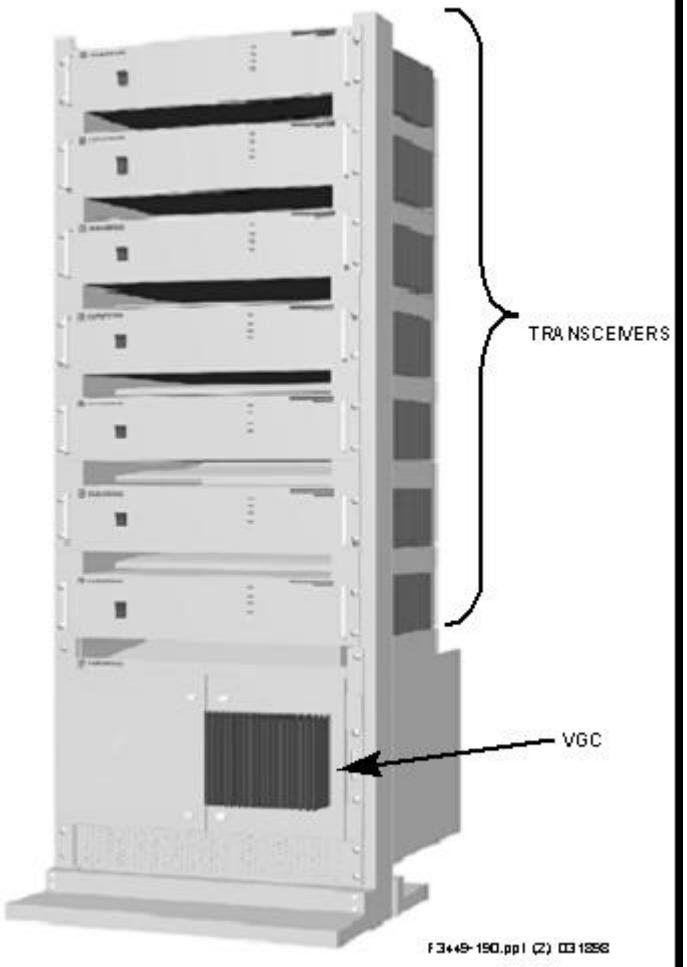
Worldwide Satellite AIRCOM Coverage



VDL Mode 2 benefits

- **One VDL channel provides a 10 to 20 times capacity increase over one ACARS channel**

SITA Infrastructure Upgrade



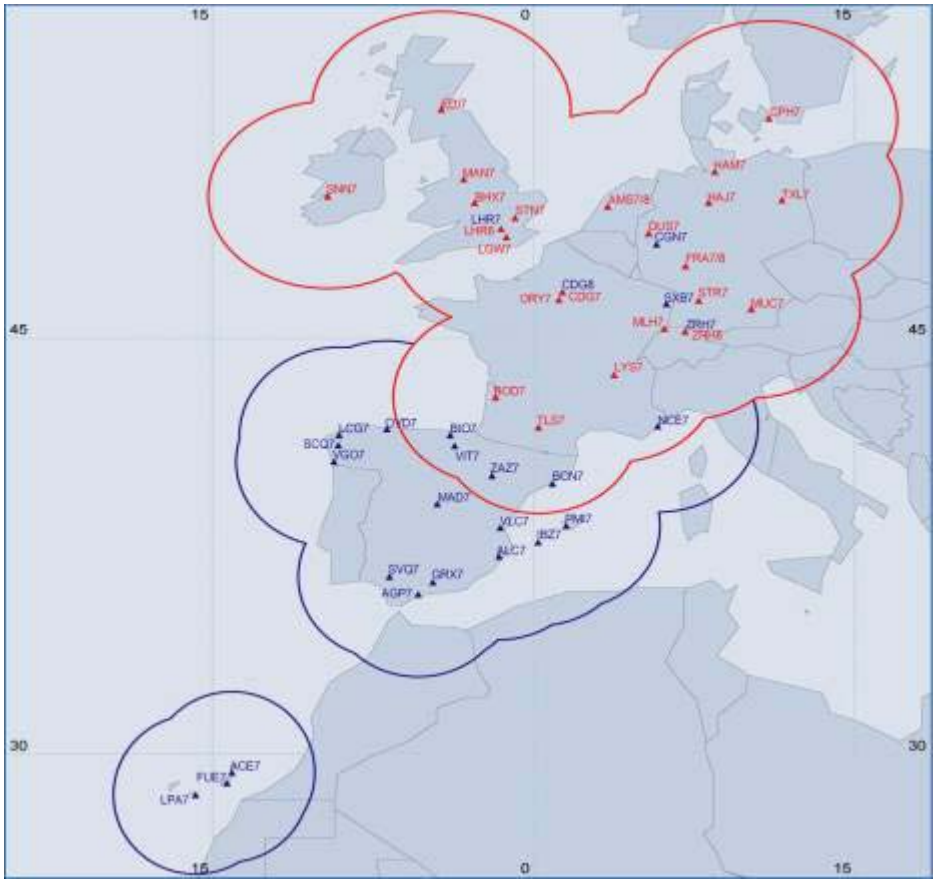
Harris contracted to produce VGS according to SITA specifications

VGS can simultaneously support

- **VHF ACARS (2.4 kbits/sec)**
- **VDL Mode 2 (31.5 kbits/sec)**
- **VDL ACARS over AVLC (AOA)**
- **VDL Mode 2/ATN**
- **VDL Broadcast**

AIRCOM Data Link ACARS Services over VDL Mode 2

- VDL *AIRCOM* (VDL Mode 2/AOA)
  - Launched May 2001
  - Successful Flight test with Airbus in October 2001
  - Used by KLM, Air France, Qantas etc.
- 39 VDL Sites On-Line as of Feb 2004
  - Focus on providing service in Western Europe where ACARS traffic is highest
  - Stations in Asia/Pac: Singapore, Sydney
  - 2 stations in US-Miami, ATL



ATS AIRCOM Services

- **SITA offers Air Traffic Service providers access to the AIRCOM data link network to communicate with the user aircraft for these applications**
  - **FANS-1/A**
    - **Supports the aircraft with FANS-1/A avionics running the AFN, CPDLC, and ADS applications**
  - **Pre-FANS**
    - **FIS: ATIS, TWIP**
    - **Departure Clearance, Oceanic Clearance**
  - **Centralized FMC Waypoint Reporting System (CFRS)**

SITA FANS Customers

Digital ATIS Available for Various Locations in these Countries

- Australia
- Austria
- Bahrain
- Canada
- China
- Denmark
- France
- Germany
- Ivory Coast
- Japan
- Korea
- New Zealand
- Norway
- Portugal
- Singapore
- Sweden
- Switzerland
- Thailand
- United Kingdom
- US

PDC or DCL, OCL, TWIP, DDTC Available at Various Locations in these Countries

PDC

- Australia
- China
- United States

DCL

- Belgium
- Denmark
- France
- Ivory Coast
- Korea
- Sweden
- United Kingdom

OCL

- United Kingdom
- Canada

TWIP

- United States

DDTC

- United States

ATS AIRCOM SYSTEMS

- **SITA sells systems enabling ATS providers to use data link communications:**
  - **d-ATIS System (AIRCOM evatis)**
  - **DCL System (AIRCOM clever)**
  - **ACARS Gateway**
  - **ADS/CPDLC Gateway**
    - **Dual stack ATN/FANS gateway**

ATN Background

- Air Traffic Service providers defined ICAO standard for an ATN protocol to be used via VDL, Inmarsat etc.
  - ATN provides same functionality as ACARS but transports binary data and provides better end-to-end integrity.
  - US FAA Initial Daily Use of CPDLC Build 1 in Miami on October 7, 2002
  - Eurocontrol ATN Controller Pilot Data Link program (Link2000+) calls for aircraft in high density airspace to use ATN messaging over VDL Mode 2 for CPDLC.
    - Three step approach
      - Pioneer Airlines
      - Incentives
      - Mandate

SITA ATN Service

- **SITA is implementing an operational ATN router in mid 2004 to provide aircraft operators with ATN access to Eurocontrol.**
- **SITA ATN Service capable of supporting CPDLC and/or ADS over**
  - **ATN/SATCOM Data-3 connection**
  - **ATN/VDL Mode 2**

Link2000+ ATN/CPDLC Area Control Center (ACC) Implementations[1]

- **Service Available Now**
  - **Maastricht UAC (Eurocontrol)**
- **Implementations to be completed in 2005-2007 Timeframe**
  - **Karlsruhe UAC (DFS)**
  - **Canarias ACC (AENA)**
  - **Reims ACC (DNA)**
  - **Roma ACC (ENAV)**
  - **Lisboa ACC (Nav Portugal)**
  - **Switzerland UAC (Skyguide)**
- **All Link2000+ area upper airspace to be covered by 2008**
- **FANS-1/A Accommodation**
  - **Maastricht UAC currently accommodates FANS-1/A aircraft**
  - **Individual states will determine whether or not they will accommodate.**

[1] Wandels, Alex, Eurocontrol, *Link2000+ CPDLC Deployment in Europe*, 2004 GATM Users Conference, 11 March 2004.

Link2000+ ATN/CPDLC Airline Participation*

- **Airlines signed to use SITA ATN Service in Europe**
  - **FedEx (15 A310s)**
  - **Lufthansa (20 A320s)**
  - **Hapag Lloyd (20 B737s)**
  - **Air Europa (19 B737NGs)**

- **Airlines signed to use ARINC ATN Service in Europe**
  - **Scandinavian Airlines System (20 737NGs)**
  - **American Airlines (13 767s)**

- **Airlines committed to Link2000+ but have not yet announced their ATN Service Provider**
  - **Airbus Transport International (5 A300-600 ST)**
  - **Others Expected**

*** These airlines have committed to Link2000+ program. SAS and AA are all equipped. The other committed airlines will complete equipping the committed aircraft during 2004-1Q2005 timeframe.**

IP Based Solutions

- SITA Flightlink, based on Inmarsat Swift64, providing aircraft with 64 kbits/sec + communications in two modes.
  - Circuit-mode Mobile ISDN Service (MISDN)
  - Mobile Packet Data Service (MPDS)
- Aircraft can use SITA Flightlink for airborne video conferencing and other in-flight office services.
- Aircraft can use SITA Flightlink to provide IP service to Electronic Flight Bags enabling new applications.
- IP Over VDL Mode 2
  - SITA has demonstrated in lab environment.
  - Now part of AEEC Datalink Systems Subcommittee work program.

EFB Applications & Benefits

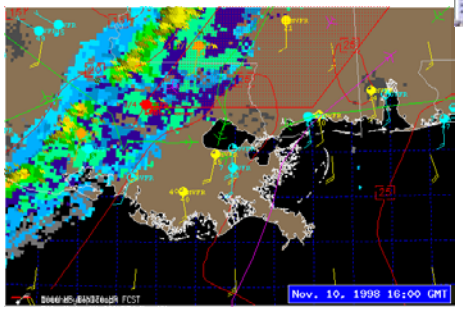
- **Electronic Flight Bag (EFB) is a tool to enhance an aircraft operational efficiency**
  - **Electronic Manuals / Charts & Maps**
  - **Electronic Logbook / Graphical Fault Reporting**
  - **Graphical Weather**

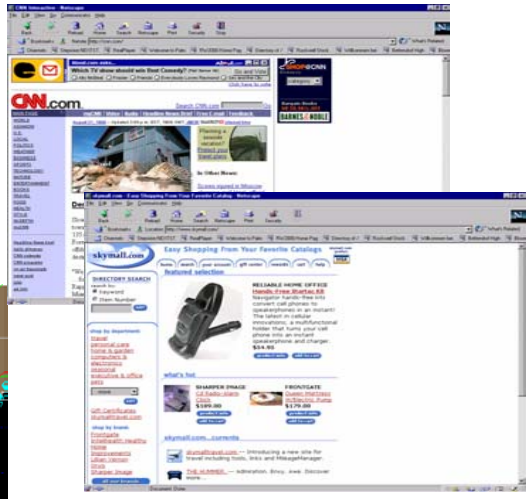
- **Applications Have Tangible, Quantifiable Savings**
  - **Productivity Enhancement**
    - **Electronic Documents, Electronic Logbook, Graphical Fault Reporting**
  - **Cost Reduction**
    - **Updating Charts & Maps**

EFB/IP-based Applications

Flight Deck

- Graphical Weather
- Charts and Maps
- Electronic Manuals
- Performance Calc.
  - Weight and balance
  - Take-Off Data
  - Airline Manuals
- Electronic Logbook
- Graphical Fault Reporting



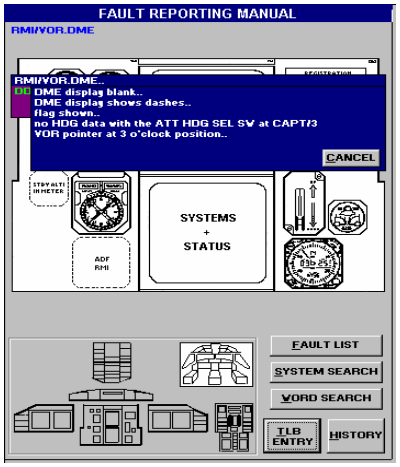


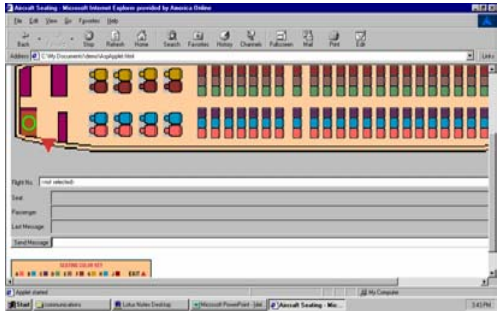
Passenger

- Passenger E-mail
- Internet
- Reservations & Ticketing
- Surveys & Statistics

Maintenance

- Virtual QAR (FOQA Data)
- Electronic Logbook
- Graphical Fault Reporting
- Maintenance Manuals
- 615 Data Load
- IFE BITE Downlink
- Equipment Lists
  - Parts Ordering





Cabin Crew

- Crew Scheduling
- Electronic Manuals
- Passenger/baggage Reconciliation

Conclusion

- **SITA**
  - **has pioneered the introduction of the VHF and SATCOM ACARS service which is today an integral part of airline operations**
  - **encourages and supports ATS providers to use the ACARS service for the introduction of initial ATS applications**
  - **has actively contributed to the development and validation of AEEC and ICAO CNS/ATM standards**
  - **is in the process of upgrading its entire VHF ACARS infrastructure to provide VDL Mode 2 services**
  - **is prepared for the introduction of ATS services over ATN/VDL Mode 2**
  - **committed to working with airlines and ATS providers to ensure that CNS/ATM becomes a reality**
  - **committed to continuing to evolve its service offerings to beyond the AOA/ATN**

Thank you for your attention

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